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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,575

04/07/2004

Scott E. Moore

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EXAMINER

PUNNOOSE, ROY M

ART UNIT

PAPER NUMBER

2886

MAIL DATE

DELIVERY MODE

03/17/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,575	<b>Applicant(s)</b> MOORE ET AL.	
	<b>Examiner</b> Roy M. Punnoose	<b>Art Unit</b> 2886	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 November 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 19-21, 49-52, 59, 60, 63, 65-69 and 71-81 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 19-21, 49-52, 59, 60, 63, 65-69 and 71-81 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/09/2007; 12/05/2006</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on 11/09/2009 is acknowledged and has been entered into the records. In the amendment the applicant has cancelled claim 64. Claims 1-18, 22-48, 53-58, 61-62 and 70 have been cancelled previously. Claims 19-21, 49-52, 59-60, 63, 65-69 and 71-81 are pending in the application.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 11/09/2007 has been considered by the Examiner. The Examiner has found that U.S. Patent 3,809,243 included in said IDS filed by the applicant is relevant to applicant's claimed invention. For the above reason, with regret, the allowability of the claims stated in the previous office action has been withdrawn.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 19-21, 60, 63, 65-66, 68 and 75-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over Topol (US\_3,441,737) in view of Teders (US\_3,809,243).**

5. Claims 19-21, 60, 63, 65-69 and 75-77 are directed to an *apparatus* (to monitor turbidity). Claims 49-52, 59, 71-74 and 78-81 are directed to a turbidity monitoring *method*.

6. Claims 19-20, 60 and 75-76 are rejected because:

- A. Topol teaches of an apparatus comprising: a container/tank (see col.1, line 13) configured to provide a subject material in a substantially static state (in a settling tank – see abstract); and at least one sensor 12 provided at a predefined position relative to the container to monitor the turbidity of the subject material at a desired vertical position of the container (see col.1, lines 51-54), in a system for measuring/monitoring turbidity of a subject material in static state in a container.
- B. However, Topol does not teach of a plurality of sensors individually configured to monitor turbidity of the subject material, wherein the sensors are individually configured to monitor the turbidity using particulate matter of the subject material, and wherein the particulate matter monitored by one of the sensors is different than the particulate matter monitored by another of the sensors, in a system for measuring/monitoring turbidity of a subject material in static state in a container.
- C. Teders teaches of a sensor 10 that is/can be individually configured to monitor turbidity of a subject material (see col.1, lines 3-6, line 29; line 67; col.5, lines 28-34; col.7, lines 23-29) in a system for measuring/monitoring turbidity of a subject material in a container.
- D. In view of Teders' teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a plurality of Teders' individually configured sensors placed at different predefined positions relative to the container into Topol's system, due to the fact that Topol's sensor/probe lowering mechanism can be eliminated for monitoring turbidity at different levels and/or locations, and further, Teders' individually configured sensors when placed at desired levels/locations, would not disturb or agitate the particulate matter in the subject material, and therefore improve

the accuracy in the measurement or monitoring of turbidity, in a system for measuring/monitoring turbidity of a subject material in static state in a container.

- E. With regard to the limitation “the particulate matter monitored by one of the sensors is different than the particulate matter monitored by another of the sensors,” a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In the instant case, Teders’ sensor determines the turbidity by passing light through a subject material and measuring the turbidity from the intensity of light incident on a detector, and Teders teaches of adjusting the sensitivity of the sensor for different turbidity level (see col.1, line 66- col.2, line 5). Therefore, by adjusting the sensitivity, Teders’ sensor is capable of monitoring different particulate matter in the subject material (see col.1, lines 3-6, line 29; line 67; col.5, lines 28-34; col.7, lines 23-29). Therefore it meets the claim. Further, Teders’ sensor is mounted over/around a glass tube/container 20 (see col. 2, lines 64-66) and may be positioned at any desired location on the tube/container 20. By placing a plurality of Teders’ sensors at different locations, and by adjusting the sensitivity of individual/each sensor for monitoring different particulate matter and/or turbidity level, different particulate matter may be monitored by different sensors at different locations. Therefore it meets the claim.
- F. In summary, the desirability of determining turbidity level of a subject material in static state at different locations of a container is clearly stated by Topol (see abstract; col.1, lines 49-55). And, Teders provides an individually configurable sensor for measuring

turbidity of a subject material in a container. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a plurality of Teders' sensors placed at different predefined positions relative to the container into Topol's system, for monitoring different particulate matter and/or turbidity level by different sensors at different locations, to obtain a more accurate representation of the turbidity level of a subject material in static state in a container.

7. Claim 21 is rejected for the same reasons of rejection of claim 19 above and because Teders' sensor comprises a source 30 configured to emit electromagnetic energy towards the container 20, and a receiver 32 configured to receive at least some of the electromagnetic energy (see Figure 2).

8. Claim 63 is rejected for the same reasons of rejection of claim 19 above and because, in view of Topol's and Teders' teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the container containing the subject material included/connected to a process chamber configured to receive and process a semiconductor workpiece using the subject material, because the turbidity of a fluidic subject material, such as a slurry from a semiconductor wafer processor, can be monitored/measured for maintaining a desired level of particular matter in the fluidic subject material. This is very similar to Teders' teachings where turbidity monitor is connected to or included in a dialysis equipment, which is a blood processor (instead of a semiconductor processor).

9. Claim 65 is rejected for the same reasons of rejection of claim 19 above and because Topol teaches of at least one sensor is configured to monitor settling of the particulate matter within the fluid, and for reasons stated in the rejection of claim 19 above, it would have been

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obvious to one of ordinary skill in the art at the time the invention was made to include Teders's sensor also configured to monitor settling of the particulate matter within the fluid.

10. Claim 66 is rejected for the same reasons of rejection of claim 19 above and because Topol teaches of monitoring a precipitation rate of the particulate matter within the fluid (see col.2, lines 4-11).

11. Claim 68 is rejected for the same reasons of rejection of claim 19 above and because in view of Topol's and Teders' teachings, and Topol's teaching of monitoring all particulate matter suspended in the fluid at a respective vertical position of the container, it would have been obvious to one of ordinary skill in the art at the time the invention was made to orient the sensor in any desired manner to optimize the monitoring of any particulate matter suspended in the fluid subject material.

**12. Claims 67 and 77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Topol (US\_3,441,737) in view of Teders (US\_3,809,243) and further in view of Hungerford et al (US\_5,172,332).**

13. Claim 67 is rejected for the same reasons of rejection of claim 19 above and because:

- A. Topol and Teders teach all claim limitations except for a computer coupled with the sensors and configured to access information regarding the turbidity of the subject material. Topol teaches of sensor output to a continuous recorder for having a hard copy of the data for analysis, in a system for measuring/monitoring turbidity of a subject material in static state in a container.
- B. Hungerford et al (Hungerford hereinafter) teaches of a computer coupled to sensors and configured to access information regarding various parameters of a subject material (see

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col.1, line 44; col.2, lines 58 - col.3, line 32; Figures 1 and 7) in a system for measuring/monitoring various parameters, including turbidity, of a subject material in a container.

- C. In view of Hungerford's teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Hungerford's teaching of connecting a sensor to a computer into Topol's system, due to the fact that it would provide a means to automatically collect and store subject material data into the computer for analysis to adjust the turbidity to a desired level for improved processing of a semiconductor workpiece.

14. Claim 77 is rejected for the same reasons of rejection of claims 19 and 67 above and because:

- A. Topol and Teders teach all claim limitations except for a computer configured to calculate information regarding settling of particulate matter within the subject material using information from the one and other sensors, in a system for measuring/monitoring turbidity of a subject material in static state in a container.
- B. Hungerford et al (Hungerford hereinafter) teaches of a computer coupled to sensors and configured to access information regarding various parameters of a subject material from different sensors, creating a database, manipulating the data for statistical analyses, spreadsheeting or the like by a conventional computer provided with a suitable software program (see col.1, line 44; col.2, lines 58 - col.3, line 32, specifically col.3, lines 6-9; Figures 1 and 7).



C. In view of Hungerford's teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate information regarding settling of particulate matter within the subject material using information from the one and other sensors because Hungerford's teaching of accessing information regarding various parameters of a subject material from different sensors, creating a database, manipulating the data for statistical analyses, spreadsheeting or the like are performing similar tasks as being claimed, in a system for measuring/monitoring turbidity of a subject material in a container.

**15. Claim 69 is rejected under 35 U.S.C. 103(a) as being unpatentable over Topol (US\_3,441,737) in view of Teders (US\_3,809,243) and further in view of Meyer (US\_4,390,283).**

16. Claim 69 is rejected for the same reasons of rejection of claim 19 above and because:

A. Topol and Teders teach all claim limitations except for container containing the subject material is configured to rotate about an axis during the monitoring of turbidity by the sensors, in a system for measuring/monitoring turbidity of a subject material in static state in a container.

B. Meyer teaches of a container 12 containing a subject material is configured to rotate about an axis during the monitoring of turbidity by the sensors, in a system for measuring/monitoring turbidity of a subject material in a container (see col.3, lines 17-22; Figures 1 and 2).

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C. In view of Meyer's teaching, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate Meyer's teaching of rotating the container about an axis during the monitoring of turbidity into Topol's system, due to the fact that the rotation of the sample container causes a reduction in the optical distortion caused by imperfections in the container walls resulting in more accurate monitoring/measuring of turbidity in a system for measuring/monitoring turbidity of a subject material in a container.

**17. Claims 49-52, 59, 71-74 and 78-81 are rejected for the same reasons of rejection of claims 19-21, 60, 63, 65-69 and 75-77 above because claims 49-52, 59, 71-74 and 78-81 are directed to a turbidity monitoring method implemented using the apparatus claimed in claims 19-21, 60, 63, 65-69 and 75-77, and they have similar limitations.**

***Remarks***

18. The applicant is requested to phone the Examiner if the applicant believes an interview, personal or telephonic, would be helpful in expediting the prosecution of this application.

***Contact/Status Information***

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Roy M. Punnoose** whose telephone number is **571-272-2427**.

The examiner can normally be reached on 9:00 AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Tarifur Chowdhury** can be reached on **571-272-2287**. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**/Roy M. Punnoose/**  
Primary Patent Examiner  
Art Unit 2886